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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,555

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EXAMINER

ODOM, CURTIS B

ART UNIT

PAPER NUMBER

2611

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,555	<b>Applicant(s)</b> KOCHALE ET AL.	
	<b>Examiner</b> CURTIS B. ODOM	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because they should include reference labels for the different components of the figures (see Figs. 1-12). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (U. S. Patent No. 6, 937, 551) in view of Taki et al. (U. S. Patent No. 5, 809, 406).

Regarding claim 1, Miyashita et al. discloses an arrangement (see Fig. 10) for adaptive bit recovery including an adaptive equalizer (block 111, column 13, lines 29-54) and an adaptive partial response maximum likelihood detector (block 112, column 13, lines 29-54). Miyashita does not disclose the arrangement further includes an overflow control block for the adaptive equalizer for monitoring one or more of the adaptation coefficients.

However, Taki et al. discloses monitoring tap (adaptation) coefficients of an equalizer and outputting an alarm signal if there is a tap coefficient which is likely to overflow (see column 8, lines 1-9). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Miyashita et al. with the teachings of Taki et

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al. since Taki et al. states the alarm predicting information reduces a hit rate of the circuit (see column 2, lines 48-54).

Regarding claim 12, Miyashita et al. further discloses the arrangement is an apparatus for reading from a recording media (see column 1, lines 15-17).

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (U. S. Patent No. 6, 937, 551) in view of Taki et al. (U. S. Patent No. 5, 809, 406), and in further view of Dieterich (U. S. Patent No. 5, 335, 020).

Regarding claim 2, Miyashita et al. and Taki et al. do not disclose a scaling block for applying a scaling to one or more of the data paths of the coefficient values when the overflow control block indicates that one or more of the coefficients run out of their intended data range.

However, Dieterich discloses detecting an overflow condition in a filter/equalizer, wherein responsive to a signal indicative of an overflow, the weighting coefficients of the filter/equalizer are scaled to lessen the sum of the magnitudes of the weighting coefficients (see column 3, lines 51-65. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Miyashita et al. and Taki et al. with the teachings of Dieterich since Dieterich states scaling the coefficients reduces the possibility of filter instability (see Abstract).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (U. S. Patent No. 6, 937, 551) in view of Taki et al. (U. S. Patent No. 5, 809, 406), and in further view of Sugiyama (U. S. Patent No. 5, 245, 561).

Regarding claim 3, Miyashita et al. and Taki et al. do not disclose means for obtaining phase information by comparing the highest absolute coefficient value with its coefficient

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number. However, Sugiyama discloses an adaptive filter which compares the maximum tap number with an inactive tap number (see column 11, lines 35-54). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Miyashita et al. and Taki et al. with the teachings of Sugiyama since Sugiyama states the adaptive filter cancels intersymbol interference (see column 1, lines 4-11).

5. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (U. S. Patent No. 6, 937, 551) in view of Taki et al. (U. S. Patent No. 5, 809, 406), and in further view of Okumura et al. (US 2005/0193318).

Regarding claims 4-6, Miyashita et al. and Taki et al. do not disclose a control logic for an adaptation constant for a tap value update for the coefficients, a gradient analyzing block for analyzing a gradient of the coefficient transitions for monitoring the speed of adaptation, and a set level block for performing an adaptation coefficient scaling in dependence on the value of the detected gradient.

However, Okumura discloses a tap coefficient update circuit which updates/adapts taps by scaling the tap coefficients by a gradient value and an adaptation constant (see sections 0144-0145), wherein the gradient value is obtained by analyzing a gradient of coefficient transitions (see section 0159). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Miyashita et al. and Taki et al. with the teachings of Okumura since Okumura states the equalization adapting means including the gradient calculation is constructed using a simpler circuit arrangement (see section 0232-0233).

6. Claims 7, 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burd (U. S. Patent No. 7, 155, 660) in view of Itoi et al. (U. S. Patent No. 5, 511, 080).

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Regarding claim 7, Burd discloses an arrangement for adaptive bit recovery (see Fig. 3) including an adaptive equalizer (see block 44, column 2, lines 50-55) and an adaptive partial response maximum likelihood detector (block 48, column 2, lines 55-63), wherein the arrangement includes a noise detector (block 54, column 3, lines 36-67 and column 6, lines 23-38) for detecting larger deviations of the target values. Burd does not disclose the arrangement further includes a state violation checker for monitoring the allowed states and indicating state violations.

However, Itoi et al. also discloses an arrangement for adaptive bit recovery including a state violation checker for monitoring the allowed state transitions and indicating state violations (see column 6, lines 23-47), wherein in the presence of a state violation, bit error correction is performed. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Burd with the teachings of Itoi et al. since Itoi et al. states error rate of random error is improved (see column 6, lines 43-47).

Regarding claim 8, Burd discloses a controllable scaling block (Fig. 8, block 214, see column 6, lines 48-59) for scaling the target value update to reduce the impact of sample changes.

Regarding claim 11, Burd discloses the error signal information is provided to a non-linear filter (see Fig. 8, block 216) for further processing.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burd (U. S. Patent No. 7, 155, 660) in view of Itoi et al. (U. S. Patent No. 5, 511, 080), and in further view of Oki (US 2004/0133842).

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Regarding claims 9 and 10, Itoi et al. discloses a path memory (see Fig. 31, block 205) and finding invalid state/bit transitions (see column 6, lines 23-47), but Burd and Itoi et al. fail to disclose a survivor control block for storing path decisions for each state and the most likely state.

Oki discloses a state metric storage which stores path metrics/decisions for each state including maximum likelihood state information (see sections 0071-0073). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Burd and Itoi et al. with the teachings of Oki since Oki states the device reduces the amount of calculations necessary for data rate detection (see section 0047).

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CURTIS B. ODOM whose telephone number is (571)272-3046. The examiner can normally be reached on Monday- Friday, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Curtis B. Odom/  
Primary Examiner, Art Unit 2611  
December 5, 2010